



# STAFF REPORT

## SAUSALITO CITY COUNCIL

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### AGENDA TITLE:

Consultant Services Agreement – Infiltration and Inflow Study

### RECOMMENDED MOTION:

Authorize City Manager to execute contract with RMC Water and Environment

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### SUMMARY

On April 10, 2008 the U.S. E.P.A. issued a "Findings of Violation and Order for Compliance" (EPA Order). Prior to the City's receipt of the EPA Order, the City and Sausalito Marin City Sanitary District (SMCSD) had been discussing methods to cooperate to improve the sanitary sewer system. One step which was discussed was conducting an infiltration and inflow study to determine if any of the sewer pipes are leaking. Leaking pipes can result in increased quantity and decreased quality of the sewer effluent being delivered to the treatment plant for processing.

A request for proposals and qualifications was sent to ten Sanitary Sewer Engineering firms believed to be experienced with sewer infiltration and inflow (I & I) investigations. The goal of the effort is to closely examine sewer segments which may be contributing to the I & I and determine limits and recommendations for sewer main repairs and elimination of unpermitted connections. RMC Water and Environment submitted a proposal. Staff found the firm to be qualified. They estimate the cost of the study to be \$89,903. The Sewer Fund includes a budget of \$75,250 for Infiltration and Inflow, Flow Monitoring and Smoke Testing.

Staff seeks authorization to enter into an agreement with RMC Engineers.

### BACKGROUND

Sanitary Sewer Infiltration and Inflow (I & I) is a water quality issue because I & I can cause excessive hydraulic variability. At the downstream end of the sewer collection system excessive I & I can cause flooding at sewage treatment plants. Such flooding can result in failure in the sewage treatment processes. Treatment plant operators faced with flooding may be forced to discharge plant flows with less than full treatment.

While this has been an on-going practice, there is a trend to reduce and potentially eliminate such practices in an attempt to raise water treatment standards.

The Environmental Protection Agency (EPA) and the California Water Quality Control Boards (Waterboard) have been studying I & I for decades. Initial regulation began in the mid 1980's. Sausalito did a survey level study in 1986 to begin to address the problem. The study found identified numerous locations for repair. The resource demand to correct the problems was enormous. The conventional thinking of proper sewer management from the 1980's, to locate all leaks and remove them, proved to be infeasible economically and politically. Also, there currently is no professional or scientific consensus on whether making of sanitary sewers completely water tight will improve water quality. Nonetheless, issues remain and it is necessary to identify and repair sites where I & I is problematic.

The EPA Order prescribes actions that must be taken by the City and with the knowledge and cooperation of the Tamalpais Community Services District (TCSD) and SMCSD. One such action is the reduction of I & I.

Sausalito had identified the need to do I & I study as a result of earlier efforts dating from 1986 and continuing through today. The study was most recently identified in a sewer system needs study performed in 2002. The study has remained in the Sewer budget since then. Such study will enable definition of specific corrective measures.

The City issued a request for proposal and qualifications for I & I on March 28, 2008. The request was sent to 10 firms with a deadline to respond on April 22, 2008. One firm responded. RMC Water and Environment, with a local office based in Walnut Creek.

Staff has reviewed the proposal and reviewed recent work from RMC. RMC completed a study for SMCSD to analyze wet weather performance and to develop and analyze options for reducing wet weather flows. The work was a planning level analysis of the primary conveyance sewer line owned and operated by SMCSD and located in Sausalito, Marin City. They also evaluated portions of TCSD connecting main. Staff believes it is one of the most robust engineering analysis efforts done in Southern Marin. Because of that study RMC staff are aware of conditions in the City. Also because of that study staff believes the propose team to be qualified to perform the work.

## ISSUES

The City's purchasing policy requires evaluating proposals from at least three firms when the work or product is not proprietary. Staff solicited proposals from ten firms. One responded. Though staff believes that RMC is qualified, the Council may want to direct staff to seek additional proposals.

## FISCAL IMPACT

The proposed work will have no impact on the General Fund. The work is proposed to be funded from the Sewer Fund which comes from sewer charges added to property tax assessments.

The estimate for the work is \$89,903. The Sewer Fund Budgeted \$75,250 for Infiltration and Inflow, Flow Monitoring and Smoke Testing. Current staff is not familiar with how the original budget amounts were determined. Current staff did assist in the adjustment of the budget in the 2007 and 2008 Budget Cycles. Those adjustments attempted to account for changes in the cost of living between 2002 and now. Given the presumed lack of budget adjustment between 2002 and 2006, RMC's knowledge of the City's collection system and the EPA Order mandates, staff believes the proposed estimate is reasonable will result in developing comprehensive information demanded by the Federal Regulators.

Because of the time of the year, a purchase order requisition is not attached. If approved a purchase order requisition will be prepared as quickly as feasible in the month of July in Budget Year 2009. The projects are included in the 2009 Budget at the levels cited previously.

## STAFF RECOMMENDATIONS

Adopt a motion authorizing the City Manager to execute a professional services agreement with RMC Water and Environment in an amount not to exceed \$89,903 without further authorization.

## ATTACHMENTS

Request for Proposal  
Request distribution list  
Professional Services Agreement

PREPARED BY:



Todd Teachout, City Engineer

REVIEWED BY (Department Head):



for Vacant, Director of Public Work

REVIEWED BY (City Attorney):

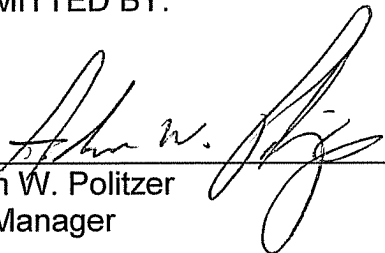
REVIEWED BY:

Item #: ~~6F3~~ 6F3  
Meeting Date: June 10, 2008  
Page #: 3

REVIEWED BY (City Attorney):

  
Mary Wagner, City Attorney

SUBMITTED BY:

  
Adam W. Politzer  
City Manager

**REQUEST FOR QUALIFICATIONS AND PROPOSAL FOR  
CONSULTANT SERVICES TO PREPARE A FOCUSED SEWER  
INFILTRATION AND INFLOW STUDY WITHIN THE CITY OF  
SAUSALITO**

Release date: March 28, 2008

Closing date: April 22, 2008

Contact person: Todd Teachout, City Engineer

## **INTRODUCTION**

The City of Sausalito (The City) seeks a qualified consultant to correct Infiltration and Inflow (I & I) problems in its Sanitary Sewerage Collection System. The City desires to limit infiltration and inflows to better control the quality of discharges going to the treatment plant operated by Sausalito Marin City Sanitary District and to eliminate sewer and or storm drain cross connections that may be causing discharges of pathogens to Richardson Bay. The sanitary sewerage effluent water quality is known to be high in salinity and suspended solids which impair treatment processes in treatment plant reactor chambers.

The City has approximately 22 miles of Sanitary Sewers. The City had a Sewer Evaluation done in 1986 by JayKim Engineers which included I & I evaluation. That study concluded that the majority of problems were the result of direct connections, leaking service laterals, deteriorating sewers and appurtenances, and groundwater. City began an I & I reduction program subsequent to the issuance of that 1986 report and has implemented both administrative programs and capital projects to begin to address the problem. The City adopted a Sewer Ordinance requiring lateral inspection and verification of condition. The City created and operates a Capacity Management, Operations and Maintenance (CMOM) Program. The City has a very active ongoing sewer cleaning program. The City's CMOM contains a full inventory of the Sanitary Sewer System (mains only) and Maintenance Records. The City performed a video inspection of the Sewer System in 2001/02 and has been recording maintenance activities through the system since that time. The

Sausalito-Marín City Sanitary District (SMCSD) had a Wet Weather Conveyance and Treatment Plant Evaluation Study prepared by RMC Engineers (RMC) in 2007. RMC preliminarily concludes that there are four localized areas in the City where I&I is an acute problem. The locations are:

1. Gate 5 Road
2. Princess/Bridgeway
3. Anchor Street/Spinnaker Pier
4. Richardson Street/Main Street

SMCSD also has had a Saltwater Infiltration report prepared by E2 Engineers (E2) also in 2007. E2 preliminarily has concluded that the Gate Five and Princess Street collection system watershed areas are the principle sources of tidally influenced I/I. These two areas should be targeted for I/I reduction efforts. The consultant is expected to evaluate these and other efforts that attempt to determine the extent of the known problems and then recommend cost effective and practical remedies.

Sausalito is a small city at the southern end of Marin County and has shoreline along San Francisco and Richardson Bays. The City was incorporated in 1893. It has a population of approximately 7,500. The area of the City is approximately 2.5 square miles. The City operates and maintains the sewage collection system. Wastewater is treated by the independent Sausalito-Marín City Sanitary District. Commercial interests in the City include tourism based businesses (Hotels, Restaurants, gifts, tour businesses), there are numerous art galleries and artists

studios. Yachting and nautical based businesses are also prevalent. With the exception of the commercial areas residents have homes built on steep hillsides. Local streets are generally narrow (under 22 feet wide) and lack sidewalks. Sausalito provides an excellent view of the City of San Francisco, Angel Island, and the East Bay Hills. The City abuts the Marin Headlands which are a part of the Golden Gate National Recreation Area.

Because of the small size of the organization of Sausalito, the Consultant will be expected to operate independently with little staff support beyond supplying historical records and report guidance.

## **SCOPE OF WORK**

Consultants will be asked to complete the following major elements in the Sewer Fee Update Study:

- I. **Review Existing Reports** – Review past City, Sewer District (if available) and other (Regional Board, State Board, Richardson Bay Regional Authority, Army Corps, etc) studies assessing Sewer integrity. The goal is to define detailed evaluation efforts.
- II. **Evaluate Sewer Integrity(Detailed evaluation)** – Perform necessary evaluation to identify infiltration locations, define the defect(s).
- III. **Correction Strategies** – Recommend strategies to correct deficiencies with regard to limiting infiltration of sea water and suspended solids and outflows of pathogen containing effluents.
- IV. **Project List** – Identify project work scopes for corrective measures (if necessary). Develop limits, work scope and estimate to correct identified problems.
- V. **Education & Involvement** – Educate and involve appropriate staff, the citizens, and City Council in the findings and recommendations including and policy/regulation change discussions.

## **SCHEDULE**

Work will begin immediately upon execution of an agreement with the selected consultant. The desire is to have the major work to be completed before June 30, 2008.

## **BUDGET**

The City has budgeted \$75,000 for the work that can include I & I evaluation, flow monitoring and smoke testing.

## **PROPOSAL FORMAT**

A qualifying proposal shall be submitted to the City of Sausalito addressing all of the points in the above scope of work in the following format:

1. A brief description of the firm, contact person or persons, address, telephone number, fax, and e-mail address.
2. Resumes of key staff who will work on the project.
3. A description of the firm's knowledge and past experience regarding the development of sewer maintenance project plans and related work.
4. Three references who have direct knowledge and experience working with the firm on recent projects that are similar in nature to the scope of work outlined in this RFQ/P.
5. A schedule and description of milestones and deliverables to evidence progress and achievement that will coincide with billing cycles.
6. A cost proposal detailing the cost for each phase of the proposed work.

## **PROPOSAL SUBMITTAL**

1. Provide five (5) copies of the proposal no later than 5:00 p.m. on the "closing date" listed on the front page of this RFP. Proposals shall be addressed to Todd Teachout, Sausalito Community Development Department, City of Sausalito, 420 Litho Street, Sausalito, CA 94965.
2. All proposals shall be submitted in a sealed envelope, clearly marked with the title of this RFQ/P, with the closing date and time.
3. Late proposals will not be accepted.
4. All proposals, whether selected or rejected, shall become the property of the City of Sausalito.
5. The cost of RFQ/P preparation shall be that of the consulting firm and shall not be paid by the City of Sausalito.
6. Proposals shall be signed by an authorized employee in order to receive consideration.
7. City of Sausalito will not be responsible for proposals delivered to a person or location other than that specified herein.

## **SELECTION PROCESS AND AWARD CRITERIA**

1. The City of Sausalito will use a competitive evaluation process wherein the experience, background, and knowledge of each firm is evaluated as it relates to the scope of work. After the evaluation committee has reviewed and discussed proposals with the firm's proposing, each will be rated using the following rating criteria and schedule.

A.	The consultant's compliance in addressing the scope of work items and the approach to the project.	25 points
B.	The specific experience and references from former municipal clients.	15 points
C.	The consultant's working knowledge of Sausalito, Sausalito Marin-City Sanitary District and other sewer utility districts in the vicinity.	15 points
D.	The consultant's approach to completing the work scope	25 points
E.	Review of Consultant's example studies from the proposed team.	10 points
F.	The consultant's proposed fee and schedule.	10 points
	<b>TOTAL</b>	<b>100 Points</b>

2. The City of Sausalito will exercise its discretion in selecting a firm and will likely be asked by the City Council to negotiate a contract in accordance with the City's selection process.
3. The City of Sausalito reserves the right to award a contract to the firm that presents the proposal which, in the sole judgment of the City, best serves the community's interest.
4. The City of Sausalito reserves the right to reject any and all proposals, to waive minor irregularities in proposals, or to negotiate minor deviations with the successful firm.

## **CONFLICT OF INTEREST**

The consultant selected to perform the work warrants that no official or employees of the City of Sausalito, nor any business entity in which an official of the City of Sausalito has an interest, has been employed or retained to solicit or assist in the procuring of the resulting contract, nor that any such person will be employed in the performance of such contract without immediate divulgence of such fact to the City Manager.

## **INSURANCE**

The successful firm shall provide an original certificate of insurance naming the City of Sausalito as an additional insured for the following:

1. Worker's compensation.
2. General liability and property damage.
3. Automobile insurance.
4. Errors and omissions.
5. The policy shall not be cancelable within thirty (30) days advance notice to the City of Sausalito and shall be in a form approved by the Sausalito City Attorney.
6. In the event that the policy is cancelled prior to the completion of the project, the City of Sausalito may obtain the required insurance and deduct the premiums from the contract.
7. If the policy is a claims made policy, the policy shall contain language providing coverage of up to six (6) months following the completion of the contract in order to provide insurance coverage for the hold harmless provisions herein.
8. As used above, Consultant or consultant includes any administrative sub-contractor, agents, officers, or employers.

## **INDEMNIFICATION**

1. The consultant agrees to hold harmless and to indemnify from every claim or demand which may be made for any injury or death or damage to property caused by consultant in the performance with a future contract.
2. Such duty is irrespective of the date upon which the claim or demand is asserted, and if any judgment is rendered against the City for any injury, death, or damage caused by the consultant in the performance of the work, the consultant at his or her expense shall satisfy and discharge any judgment. None of the foregoing paragraphs shall be applicable to injury, death, or damage caused by the City of Sausalito's negligence. The consultant agrees that it shall immediately notify the City of Sausalito and the consultant's insurance carriers of any incident during the performance of the work which may result in a claim or liability.

## **ASSIGNMENT**

Any work resulting from this RFQ/P, and any amendments or supplements thereto, shall not be assignable by the successful bidder either on a voluntary or involuntary basis or by the operation of law without the written approval of the City of Sausalito and shall not become an asset in any bankruptcy, receivership, or guardianship proceedings.

Please limit responses to 8 to 12 pages, excluding any attachments

## **CONTACT**

All contacts regarding this RFQ/P shall be directed to:

Todd Teachout

City Engineer

City of Sausalito

(415) 289-4111

tteachout@ci.sausalito.ca.us

If you have received this RFQ/P and have no interest in responding, please pass it along to a professional firm who may. Thank you.



## REQUEST FOR PROPOSALS

### Sanitary Collection System Capital Improvements Assessment Proceedings Sewer Rate Study

LaTonya Price  
CH2MHill Engineers  
33 New Montgomery Street  
Suite 2000  
San Francisco, CA 94105  
1-415-541-7220

Kanda Raj  
Nolte Engineering  
201 North Civic Drive  
Suite 255  
Walnut Creek, CA 94596  
925-934-8060

Mark Wilson  
Nute Engineering  
907 Mission Avenue  
San Rafael, CA  
415-453-4480

Diane Fontes  
Winzler & Kelly  
417 Montgomery Street  
Suite 700  
San Francisco, CA 94104  
415-283-4970

Kerry Gudjohnsen  
Kennedy/Jenks  
622 Folsom Street  
San Francisco, CA 94107  
415-243-2150

Jennel McDonald  
CDM  
100 Pringle Avenue  
Suite 300  
Walnut Creek, CA 94596  
925-933-2900

Tessa Taylor  
Boyle Engineering  
100 Howe Avenue  
Suite 250 N.  
Sacramento, CA 95825  
916-483-7771

Janice Sykes  
Black & Veatch  
2999 Oak Road  
Suite 490  
Walnut Creek, CA 94597  
925-949-5900

Beth Linskens  
Brown & Caldwell  
201 North Civic Drive  
Suite 115  
Walnut Creek, CA 94596  
925-937-9010

Rick Chan  
Carollo Engineers  
2700 Ygnacio Valley Road  
Suite 300  
Walnut Creek, CA 94598  
925-932-1710

Vivian Housen  
RMC Water and Environment  
2001 N. Main Street, Suite 400  
Walnut Creek, CA 94596  
925-627-4100 ph  
925-627-4101 fax

CITY OF SAUSALITO  
PROFESSIONAL/CONSULTING SERVICES AGREEMENT

This **PROFESSIONAL/CONSULTING SERVICES AGREEMENT**, (this "Agreement") is made and entered into this 10th day of June, 2008, by and between the **CITY OF SAUSALITO**, a municipal corporation (hereinafter "City") and **RMC Water and Environment** (hereinafter "Consultant").

In consideration of the mutual promises contained herein, the parties hereto agree as follows:

**Section 1. Scope of Work**

Consultant shall provide City with the services described in Exhibit A which is attached hereto and incorporated herein by this reference as though set forth in full.

The duties and services required of Consultant under this Agreement and pursuant to this Section 1 are referred to throughout the remainder of this Agreement as "the Work."

**Section 2. Responsible Individual.** The individual directly responsible for the performance of the duties of Consultant is Gisa Ju. Consultant represents and warrants that the execution of this Agreement has been approved by Consultant and that person executing this Agreement on behalf of Consultant has the full authority to do so.

**Section 3. Work Schedule.**

Consultant shall be available to work as many hours as required to complete the Work immediately upon receipt of the signed Agreement from the City and shall complete each task in a timely manner as specified. Consultant shall not be held responsible for delays caused beyond its reasonable control.

**Section 4. Compensation.**

In consideration of the performance of the Work described in Section 1 pursuant to the schedule set forth in Section 3, Consultant shall be compensated at the rate set forth in Exhibit B which is attached hereto and incorporated herein as though set forth in full. Consultant shall not charge City for any administrative expenses or overhead, including without limitation, facsimile, mileage and other/or any other expenses incurred by Consultant in connection with Consultant's provision of the Work. Consultant acknowledges and agrees that the compensation to be paid to Consultant under this Section 4 represents the

full amount due and owing to Consultant in connection with performance of the Work.

#### **Section 5. Amendments.**

In the event City desires to retain Consultant for the performance of additional services, or wishes to delete any services in connection with this Agreement, specifications of such changes and adjustments to compensation due Consultant therefore shall be made only by written and signed amendment to this Agreement.

#### **Section 6. Independent Contractor - Subcontractors.**

It is specifically understood and agreed that in the making and performance of this Agreement, Consultant is an independent contractor and is not and shall not be construed to be an employee, common law employee, agent or servant of City. The consultant shall be solely liable and responsible to pay all required taxes and other obligations, including, but not limited to, withholding and Social Security. Consultant acknowledges and agrees that he/she is not entitled to the benefits of civil service status and/or the rights and privileges enjoyed by civil service employees and Consultant hereby waives any and all claims to such rights and/or privileges.

#### **Section 7. Consultant's Responsibility.**

It is understood and agreed that Consultant has the professional skills necessary to perform the Work, and that City relies upon the professional skills of the Consultant to do and perform the Work in a skillful and professional manner in accordance with the standards of the profession. Consultant thus agrees to so perform the Work.

Acceptance by City of the Work, or any of it, does not operate as a release of the Consultant from such professional responsibility. It is further understood and agreed that Consultant has reviewed in detail the scope of the work to be performed under this Agreement and agrees that in his professional judgment, the Work can and shall be completed for a fee within the amounts set forth in Section 3 of this Agreement.

#### **Section 8. Hold Harmless and Indemnification.**

- (a) To the fullest extent permitted by law and without limitation by the provisions of Section 4 below relating to insurance, Consultant agrees to defend, indemnify and hold harmless the City, its elected and appointed officials, officers, agents, employees and volunteers from any and all claims, demands, suits, losses, damages, injuries, and liability, direct or indirect including any and all costs and expenses in connection therewith,

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incurred by reason of any acts, errors, or omissions of Consultant, whether negligent or intentional, under or in connection with this Agreement. Consultant further agrees to defend the City, its elected and appointed officials, officers, agents, employees and volunteers at its own cost, expense, and risk, and to pay and satisfy any resulting judgments. The Consultant's obligations under this Section 3 apply regardless of whether or not a liability is caused or contributed to by any act or omission of the City, except that the Consultant shall not be obligated to indemnify for liability arising from the sole negligence or willful misconduct of the City. The provisions of this Section survive the completion of the Project and/or termination of the Agreement.

- (b) To the fullest extent permitted by law and without limitation by the provisions of Section 4 relating to insurance, the Consultant shall also indemnify, defend and hold harmless the City its elected and appointed officials, officers, agents, employees and volunteers from and against all liability (including without limitation all claims, damages, penalties, fines, and judgments, associated investigation and administrative expenses, and defense costs, including but not limited to reasonable attorneys' fees, court costs, and costs of alternative dispute resolution) resulting from any claim of discrimination or harassment, including but not limited to sexual harassment, arising from the conduct of the Consultant or any of the Consultant's officers, employees, agents, licensees, or subcontractors. In the event of a discrimination or harassment complaint against any employee, agent, licensee or subcontractor of the Consultant or its subcontractors, the Consultant shall take immediate and appropriate action in response to such complaint, including, but not limited to termination or appropriate discipline of any responsible employee, agent, licensee or subcontractor. The provisions of this Section survive completion of the Project and/or termination of the Agreement.

#### **Section 9. Insurance.**

Consultant shall take out and maintain during the life of the Contract: (a) Comprehensive General Liability and Automobile Liability insurance in an amount not less than \$ 2,000,000 combined single limit applying to bodily injury, personal injury and property damage; (b) professional liability insurance in the amount of \$1,000,000 per claim and \$ 2,000,000 aggregate.

The liability policy(ies) are to contain, or be endorsed to contain, the following provisions:

The City, its officers, elected and appointed officials, employees, Consultants and agents must be named as a Named Insured under the coverage afforded with respect to the work being performed under the Agreement.

**Section 10. Nondiscrimination.**

There shall be no discrimination against any employee who is employed in the Work, or against any applicant for such employment because of race, religion, color, sex or national origin. This provision shall include, but not be limited to, the following: employment, upgrading, demotion, or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship.

**Section 11. City Personnel Conflict of Interest.**

No officers, member, or employee of City and no member of the governing body of City who exercises any functions or responsibilities in the review, approval of the undertaking or carrying out of the project, shall participate in any decision relating to this Agreement which affects his personal interest or the interest of any corporation, partnership, or association in which she is, directly or indirectly interested; nor shall any such officer, member or employee of City have any interest, direct or indirect, in this Agreement or the proceeds thereof.

**Section 12. Consultant Conflict of Interest.**

Consultant covenants that she presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of his services hereunder. Consultant further covenants that in the performance of this Agreement, no persons having any such interest shall be employed.

**Section 13. Assignment.**

Consultant shall not assign any interest in this Agreement, and shall not transfer any interest in the same (whether by assignment or novation) without the prior written consent of City.

**Section 14. Ownership of Documents.**

Consultant agrees that all documents produced in the performance of this Agreement shall be the sole property of the City including all rights therein of whatever kind and whether arising from common or civil law or equity. The Work shall be used solely for the project for which it was originally intended.

**Section 15. Termination.**

City may terminate this Agreement at any time without reason stated or required by giving written notice of the same and specifying the effective date thereof, at least seven calendar days before the effective date of such

termination. If the Agreement is terminated by City as provided herein, Consultant shall be paid for all effort and material expended on behalf of the Work under the terms of this Agreement, less any charges against Consultant as otherwise provided herein, up to the effective date of termination, except that upon notification of such termination, Consultant shall immediately cease to undertake any duties under the Agreement not yet underway, and shall limit its further activities up to the effective date of termination to those duties necessary to wind up work then underway.

**In Witness Whereof**, City and Consultant have executed this Agreement as of the date first written above.

City of Sausalito

Consultant

\_\_\_\_\_  
By: Adam W. Politizer  
City Manager

\_\_\_\_\_  
By: \_\_\_\_\_  
Its: \_\_\_\_\_

approved as to form:

\_\_\_\_\_  
Mary Anne Wagner  
City Attorney

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**EXHIBIT A**  
**SCOPE OF WORK**



cross connections between the storm and sanitary systems, significant sources of infiltration and inflow, and sewers and structures in need of rehabilitation or repair.

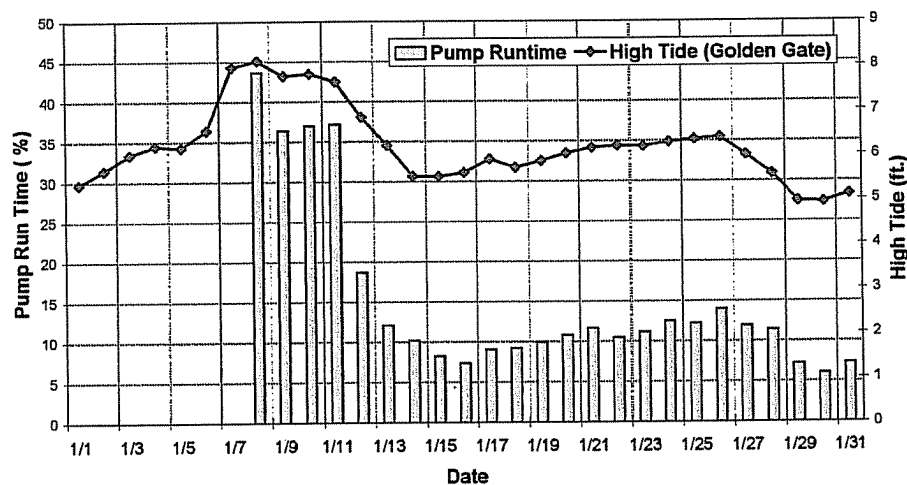
**Team Members:** Jeff Blum

**Client Contact:** Henry Yee, Supervising Civil Engineer, 510.981.6429

## 4. PROJECT UNDERSTANDING AND APPROACH

### Project Understanding

Like many communities in the San Francisco Bay Area, the City's sanitary sewer system is subject to high levels of infiltration and inflow (I/I). I/I occurs during wet weather periods, resulting in high peak flows in the City's sewer system that overwhelm SMCSD's conveyance pipelines, pump stations, and wastewater treatment plant. I/I can also occur during non-rainfall periods when saltwater infiltrates into sewers in low lying areas of the system, particularly during periods of high tide, and can result in impaired treatment performance due to increased salinity in the wastewater. The City is committed to working with SMCSD to address both of these I/I issues.



RMC's analysis of January 2005 flow data from Gate 5 Pump Station shows a clear correlation between sewage flows and tide level.

SMCSD is currently undertaking a major wet weather improvements program in conjunction with its tributary agencies, City of Sausalito and Tamalpais Community Services District. This program will evaluate alternatives to reduce peak wet weather flows, including construction of conveyance, flow storage, and treatment improvements, as well as I/I reduction in the local collection systems. Concurrent with this effort, the City is proceeding with a focused effort to reduce saltwater infiltration in low-lying areas adjacent to Richardson Bay.

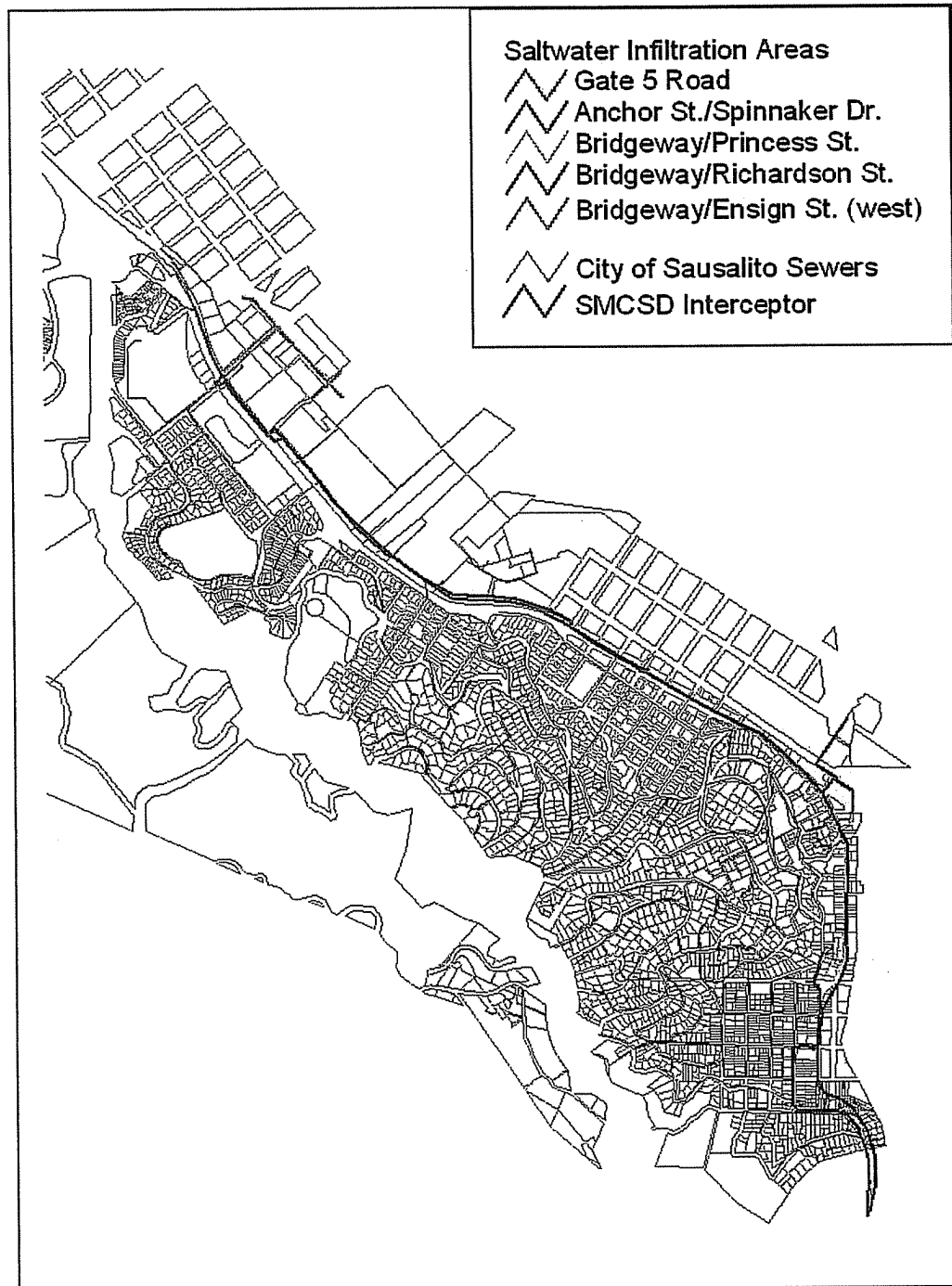
SMCSD's recent Conductivity Study, conducted by E2 Consulting Engineers, isolated the highest occurrences of saltwater infiltration to four such areas:

- Gate 5 Road
- Anchor Street/Spinnaker Drive
- Bridgeway/Princess Street (El Monte Lane to North Street)
- Bridgeway/Richardson Street

Our review of system sewer maps indicates that a fifth area, which was not monitored under the Conductivity Study, could also be a potential high saltwater infiltration area due to its proximity the other areas and the Bay. This area extends along Bridgeway from El Monte Lane north to Johnson Street and discharges to the SMCSD interceptor at Ensign Street.

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Therefore, RMC's approach to the City's I/I study focuses on these five potential saltwater infiltration areas, which are shown on the map on the following page. The areas include approximately 9,500 feet of mainline sewers and about 65 manholes.



*The focus of the I/I Study will be on identified areas of tidally-influenced infiltration.*

### Project Approach

Our overall approach includes review of existing data and field investigations to pinpoint specific sources of I/I, followed by engineering analysis of the data and field results to determine appropriate and cost-effective

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methods to eliminate these sources and reduce I/I into the sewer system. Our approach also includes assisting the City with public education and stakeholder involvement to ensure that the need for improvements and proposed corrective measures are understood by and acceptable to the community.

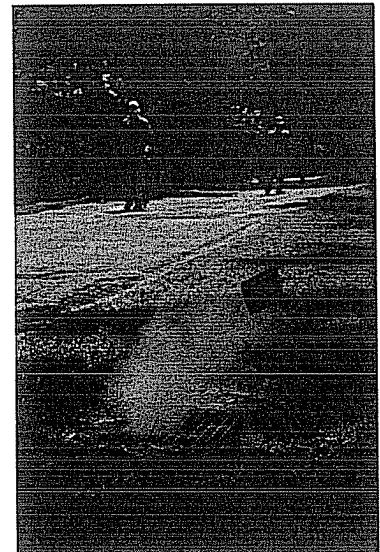
### Targeted Field Investigations Will Identify Sources of I/I

A key element in our approach will be targeting the type and timing of the field work to maximize our ability to locate and visually observe sources of I/I. I/I can enter the system by underground infiltration into defects in sewer pipes and laterals, and by direct inflow through submerged manhole covers and cleanouts, directly-connected roof leaders, area drains, and sump pumps, and cross-connections between storm drains and sanitary sewers. Cross-connections can also function in the reverse direction, allowing sanitary sewage to enter storm drains and be discharged into the Bay.

The primary methods of identifying I/I sources are smoke testing, physical inspection of manholes and other structures, and closed-circuit television (CCTV) inspection of sewer pipelines. Our approach for each of these types of investigations is described below.

**Smoke Testing.** Smoke testing is a relatively inexpensive and highly effective method of identifying direct drainage connections to the sanitary sewer system. During smoke testing, a non-toxic smoke is blown into the sewer from the manhole and will be seen to emerge at any point where surface drainage can find a pathway to the sanitary sewer. Typical direct inflow sources identified by smoke testing include roof leaders, area and driveway drains, open or defective cleanouts, and catch basins or storm drain manholes on storm sewers that are cross-connected with the sanitary system. In low-lying areas, smoke testing should be conducted during periods of low tide when flows in the sewers are low to allow maximum circulation of the smoke through the pipes.

*Smoke testing identifies potential direct drainage connections to the sanitary sewer system.*



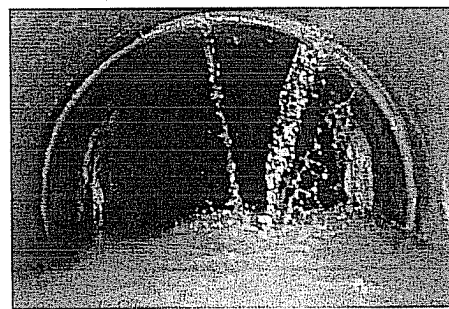
In the Bridgeway area, smoke testing will be done at a time to minimize impact to areas businesses, for example, during the time between the breakfast and lunchtime hours. Days with expected high tourism will also be avoided. For all smoke testing, E2 will provide adequate public notification through notices and door hangers, and coordinate with City staff and public safety officials to ensure that the community is not alarmed or adversely impacted by the work.

**Physical Inspection.** Physical inspection of manholes and other structures that may be potential sources of I/I is an effective way of locating potential defects that may be allowing surface inflow or below-ground infiltration. E2 will inspect all of the manholes in the potential saltwater infiltration areas. Manhole inspections will be done during periods of high tide to maximize the possibility of visually observing infiltration. If the inspections are done in the early morning hours when sewer flows are low, the manhole crews can also take spot flow and conductivity measurements at selected manholes to help isolate potential bad pipe segments, as well as video or photograph the inlet and outlet sewers (using a "camera on a stick") to identify active infiltration or defects that are likely to contribute I/I. Targeted inspections may also be conducted at other suspected locations of saltwater inflow or infiltration, such as defective flap gates at storm drain outfalls, pump station wet wells, or defective plugs in historical sewer bypasses.

Date	Time (PDT)	Tide Level (ft.)
6/5/2008	12:32 AM	6.73
6/6/2008	1:24 AM	6.48
6/7/2008	2:19 AM	6.06
6/8/2008	3:17 AM	5.50
6/20/2008	12:33 AM	5.75
6/21/2008	1:11 AM	5.63
6/22/2008	1:52 AM	5.42
6/23/2008	2:35 AM	5.11

*Manhole and CCTV inspection will be scheduled to coincide with periods of high tide and low sewer flows (midnight to 6 a.m.), such as these days in June.*

**CCTV Inspection.** E2 will contract with a qualified contractor to perform CCTV inspection of the sewers in the saltwater infiltration areas to identify pipe defects (cracks, open/offset joints, etc.) through which infiltration may enter. Sewer laterals that are significant I/I sources can also be identified by CCTV as evidenced by clear flow discharging from the lateral to the sewer. As with manhole inspections, CCTV inspection will be most effective if done during periods of low sewer flows (early morning hours) and high tide to maximize visual observation of infiltration. We will closely monitor tide schedules to identify the best days for this work, and schedule accordingly. In the Gate 5 Road area, however, CCTV inspection would not be done during periods of tidal flooding, as the sewers would likely be flowing very full under those conditions.



*CCTV inspection identifies cracks and defective joints where infiltration may enter sewer pipes.*

**Other Potential Investigation Methods.** Depending on the results of the smoke testing, manhole inspections, and CCTV inspection, the City may want to consider other more extensive types of investigations, such as building inspections to identify sump pumps that discharge to the sanitary system, or CCTV inspection of laterals to identify defects and direct drainage pipe connections. While not part of our proposed scope, these approaches would provide a very thorough evaluation of all potential sources of I/I in the saltwater infiltration areas.

### **Correction Strategies Will Target Improvements that Provide the Biggest Bang for the Buck**

RMC will review and analyze the collected field data to identify potential measures to eliminate I/I sources. Such measure may include:

- Disconnection of storm drain cross connections.
- Disconnection of drainage connections on private property (roof leaders, area drains, and sump pumps).
- Interior sealing of manhole walls.
- Grouting, lining or replacement of sewer pipelines.
- Replacement or rehabilitation of sewer laterals.

In areas subject to tidal flooding, such as Gate 5 Road, additional measures may include:

- Replacing and/or sealing of manhole covers that are subject to surface inflow.
- Replacing defective cleanouts and cleanout caps.
- Raising manholes and cleanouts above grade where possible.

While disconnection of drainage connections and sealing of manholes are obvious ways of minimizing I/I into the sanitary sewer system, these measures may also exacerbate flooding problems and lead to increased property damage and disruption to businesses and residents. Therefore, the full effects of corrective measures

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must be carefully considered in developing solutions to I/I problems. I/I reduction measures may need to go hand-in-hand with drainage improvements in order to develop effective solutions in some areas.

*The Gate 5 Road area has a history of tidal flooding which submerges manhole covers and significantly increases sewer flows. Sealing of manhole and cleanout covers and raising them above grade where possible should be considered to minimize inflow into the sanitary system.*

### A Successful I/I Reduction Program Requires Community Education and Involvement

Eliminating I/I usually requires construction work in streets and backyard easements, which causes disruption to the community and may also require corrective measures on private property. For this reason, educating the community of the need for and importance of I/I reduction is critical to a successful program. The visibility of the project team during the field investigations will help raise community awareness of the ongoing work. The RMC team will work closely with City staff in formulating public education strategies, and attend community meetings set up by the City to present study findings and recommendations. We would anticipate that these meetings would be coordinated with similar stakeholder outreach to be conducted as part of SMCSO's overall wet weather improvements program.



## 5. PROJECT SCHEDULE

RMC and E2 are prepared to begin work upon issuance of Notice to Proceed. As noted above, scheduling of field work must be closely coordinated with tide levels. Our proposed schedule and project milestones are shown below.

Task	May	Jun	Jul	Aug	Sep
Review existing information					
Field Investigations					
Smoke testing/MH inspections					
CCTV inspection					
Review/analyze field data					
Develop correction strategies					
Prepare I/I Study report					

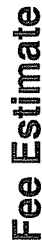
## 6. COST PROPOSAL

Our fee estimate for the project is \$89,903, as detailed in the attached table. This estimate assumes full inspection (smoke testing, manhole inspections, and CCTV inspection) of all sewers and manholes in the five potential saltwater infiltration areas (approximately 10,000 feet of pipe). Should budget be limited, however, a less extensive field work program could be conducted, focusing on the most critical areas (those with the highest conductivity measurements), including Gate 5 Road, Anchor Street/Spinnaker Drive, and southernmost Princess Street areas (approximately 6,500 feet of pipe); or by using the results of manhole and inlet/outlet pipe inspections to focus the CCTV inspection on specific sewers that are suspected of having the most significant defects. If selected for this study, we will work with the City to refine our scope of work and level of effort estimate as necessary to match the City's budget and project requirements.

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**EXHIBIT B**  
**FEE SCHEDULE**

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## Fee Estimate

## Fee Estimate

## Fee Estimate

## Fee Estimate

## Fee Estimate

## Fee Estimate

## Fee Estimate

